What is claimed is:

1. A compound having the formula S-$(L)_n$-B, wherein S is a signal providing structural unit that provides a signal that can be detected *in vivo* or detected *in vitro*, L links S to B, B is an agent other than a peptide moiety that binds to LOX-1, and n is either 0 or 1.

2. The compound of claim 1, wherein S is selected from the group consisting of a luminescent dye, a radionuclide, a near infrared dye, a magnetically active isotope, a superparamagnetic particle, a metal ion having a Z value of greater than 50, an encapsulated species, and a combination thereof.

3. The compound of claim 1, wherein S is selected from the group consisting of fluorescein, ^{11}C ^{18}F, ^{52}Fe ,^{62}Cu, ^{64}Cu, ^{67}Cu, ^{67}Ga, ^{68}Ga, ^{86}Y, ^{89}Zr, ^{94m}Tc, ^{94}Tc, ^{99m}Tc, ^{111}In, ^{123}I, ^{124}I, ^{125}I, ^{131}I, $^{154\text{-}158}Gd$, ^{175}Lu, superparamagnetic iron oxide nanoparticles, heavy metal ions, gas-filled microbubbles, optical dyes, porphyrins, texaphyrins, highly iodinated organic compounds chelates thereof, polymers containing at least one of the aforementioned components, endohedral fullerenes containing at least one of the aforementioned, and mixtures thereof.

4. The compound of claim 2, wherein S is a luminescent dye.

5. The compound of claim 4, wherein the luminescent dye is fluorescein, or derivatives thereof.

6. The compound of claim 2, wherein S is a radionuclide.

7. The compound of claim 6, wherein the radionuclide is a positron emitter.

8. The compound of claim 7, wherein the positron emitter is selected from ^{18}F and ^{11}C.

9. The compound of claim 6, wherein the radionuclide is a gamma emitter.

10. The compound of claim 2, wherein S is an infrared dye.

11. The compound of claim 2, wherein S is a magnetically active isotope.

12. The compound of claim 11, wherein the magnetically active isotope is paramagnetic.

13. The compound of claim 12, wherein the magnetically active isotope is an isotope of gadolinium.

14. The compound of claim 2, wherein S is a superparamagnetic particle.

15. The compound of claim 14, wherein the superparamagnetic particle is a nanoparticle.

16. The compound according to claim 15, wherein the nanoparticle comprises at least one of iron oxide and elemental iron.

17. The compound according to claim 2, wherein S is an element having a Z value of greater than about 50.

18. The compound according to claim 17, wherein the element having a Z value of greater than about 50 is iodine or bismuth.

19. The compound according to claim 2, wherein S is an encapsulated species.

20. The compound according to claim 19, wherein the encapsulated species is selected from the group consisting of a micelle, a liposome, a polysome, and a gas-filled microbubble.

21. The compound according to claim 1, wherein L is an organic radical having a valence of at least 2.

22. The compound according to claim 21, wherein the organic radical is covalently bound to both group S and group B.

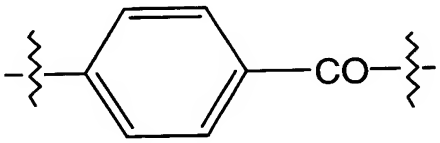
23. The compound according to claim 21, wherein the organic radical is ionically bound to one of group S and group B.

24. The compound according to claim 23, wherein the organic radical is ionically bound to both group S and group B.

25. The compound according to claim 21, wherein the organic radical comprises between 1 and about 10,000 carbon atoms.

26. The compound according to claim 25, wherein the organic radical is selected from the group consisting of alkylene, arylene, cycloakylene, aminoaklylene, aminoarylene, aminocycloalkylene, thioalkylene, thioarylene, thiocycloalkylene, oxyalkylene, oxyarylene, oxycycloalkylene, acylalkylene, acylarylene, acylcycloalkylene units, and combinations thereof.

27. The compound of claim 26, wherein the acylarylene unit is a 4-acylphenylene group having the following structure:



28. The compound of claim 21, wherein the organic radical is a metal chelating agent.

29. The compound according to claim 28, wherein the metal chelating agent binds at least one metal cation selected from the group consisting of cations of ^{52}Fe ,^{62}Cu, ^{64}Cu, ^{67}Cu, ^{67}Ga, ^{68}Ga, ^{86}Y, ^{89}Zr, ^{94m}Tc, ^{94}Tc, ^{99m}Tc, ^{111}In, $^{154\text{-}158}Gd$, and ^{175}Lu.

30. The compound of claim 30, wherein the metal chelating agent is selected from the group consisting of DTPA, 1,4,7-triaza-cyclononane-N,N',N"-triacetic acid (NOTA), p-bromoacetamido-benyl-tetraethylaminetetraacetic acid (TETA), 1,4,7,10-tetraazacyclododecanetetraacetic acid (DOTA), EDTA, CHXa.

31. A compound according to claim 1, wherein B is selected from the group consisting of antibodies, proteins, glycosylated proteins, biomolecules, polysaccharides, peptidomimetics, low molecular weight organic compounds, and combinations thereof.

32. The compound according to claim 31, wherein B is an antibody.

33. The compound according to claim 32, wherein B is a polyclonal antibody.

34. The compound according to claim 32, wherein B is a monoclonal antibody.

35. The compound according to claim 32, wherein B is an antibody fragment.

36. The compound according to claim 31, wherein B is a biomolecule.

37. The compound according to claim 36, wherein B is oxidized low density lipoprotein.

38. The compound according to claim 36, wherein B is modified low density lipoprotein.

39. The compound according to claim 31, wherein B is a protein.

40. The compound according to claim 39, wherein B is Heat Shock Protein 70.

41. A composition comprising a compound having the formula S-$(L)_n$-B, formula S-$(L)_n$-B, wherein S is a signal providing structural unit that provides a signal that can be detected *in vivo* or detected *in vitro*, L links S to B, B is an agent other than a peptide moiety that binds to LOX-1, and n is either 0 or 1.

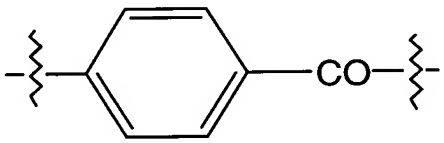
42. The composition of claim 41, wherein S is selected from the group consisting of a luminescent dye, a radionuclide, a near infrared dye, a magnetically active isotope, a superparamagnetic particle, a metal ion having a Z value of greater than 50, an encapsulated species, and a combination thereof.

43. The composition of claim 41, wherein S is selected from the group consisting of fluorescein, ^{11}C ^{18}F, ^{52}Fe ,^{62}Cu, ^{64}Cu, ^{67}Cu, ^{67}Ga, ^{68}Ga, ^{86}Y, ^{89}Zr, ^{94m}Tc, ^{94}Tc, ^{99m}Tc, ^{111}In, ^{123}I, ^{124}I, ^{125}I, ^{131}I, $^{154\text{-}158}Gd$, ^{175}Lu, superparamagnetic iron oxide nanoparticles, heavy metal ions, gas-filled microbubbles, optical dyes, porphyrins, texaphyrins, highly iodinated organic compounds chelates thereof, polymers containing at least one of the aforementioned components, endohedral fullerenes containing at least one of the aforementioned, and mixtures thereof.

44. The composition of claim 43, wherein S is selected from ^{18}F and ^{11}C.

45. The composition of claim 41, wherein L is an organic radical selected from the group consisting of alkylene, arylene, cycloakylene, aminoaklylene, aminoarylene, aminocycloalkylene, thioalkylene, thioarylene, thiocycloalkylene, oxyalkylene, oxyarylene, oxycycloalkylene, acylalkylene, acylarylene, acylcycloalkylene units, and combinations thereof.

46. The composition of claim 45, wherein the acylarylene unit is a 4-acylphenylene group having the following structure:



47. The composition of claim 45, wherein the organic radical is a metal chelating agent.

48. The composition according to claim 47, wherein the metal chelating agent binds at least one metal cation selected from the group consisting of cations of ^{52}Fe ,^{62}Cu, ^{64}Cu, ^{67}Cu, ^{67}Ga, ^{68}Ga, ^{86}Y, ^{89}Zr, ^{94m}Tc, ^{94}Tc, ^{99m}Tc, ^{111}In, $^{154\text{-}158}Gd$, and ^{175}Lu.

49. The composition of claim 48, wherein the metal chelating agent is selected from the group consisting of DTPA, 1,4,7-triaza-cyclononane-N,N',N"-triacetic acid

(NOTA), p-bromoacetamido-benyl-tetraethylaminetetraacetic acid (TETA), 1,4,7,10-tetraazacyclododecanetetraacetic acid (DOTA), EDTA, CHXa.

50. The composition of claim 41, wherein B is selected from the group consisting of antibodies, proteins, glycosylated proteins, biomolecules, polysaccharides, peptidomimetics, low molecular weight organic compounds, and combinations thereof.

51. The composition according to claim 50, wherein B is an antibody.

52. The composition according to claim 51, wherein B is a polyclonal antibody.

53. The composition according to claim 51, wherein B is a monoclonal antibody.

54. A kit comprising the composition of claim 41.

55. A method of imaging a tissue to detect the presence and/or amount of LOX-1, comprising:

administering to a mammal the compound of claim 1;

optionally administering a clearing agent to remove the compound that is not bound to LOX-1; and

subjecting the mammal to imaging effective to detect the signal generated by S to thereby detect the presence and/or amount of LOX-1.

56. The method of claim 55, wherein the mammal is suspected of a disease or disorder caused by expression of LOX-1.

57. The method of claim 55, wherein the imaging effective to detect S is positron emission tomography.

58. The method of claim 57, wherein S is selected from ^{18}F and ^{11}C.

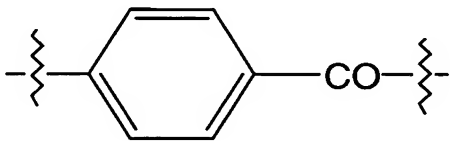
59. The methodof claim 55, wherein S is selected from the group consisting of a luminescent dye, a radionuclide, a near infrared dye, a magnetically active isotope, a

superparamagnetic particle, a metal ion having a Z value of greater than 50, an encapsulated species, and a combination thereof.

60. The method of claim 55, wherein S is selected from the group consisting of fluorescein, ^{11}C ^{18}F, ^{52}Fe ,^{62}Cu, ^{64}Cu, ^{67}Cu, ^{67}Ga, ^{68}Ga, ^{86}Y, ^{89}Zr, ^{94m}Tc, ^{94}Tc, ^{99m}Tc, ^{111}In, ^{123}I, ^{124}I, ^{125}I, ^{131}I, $^{154\text{-}158}Gd$, ^{175}Lu, superparamagnetic iron oxide nanoparticles, heavy metal ions, gas-filled microbubbles, optical dyes, porphyrins, texaphyrins, highly iodinated organic compounds chelates thereof, polymers containing at least one of the aforementioned components, endohedral fullerenes containing at least one of the aforementioned, and mixtures thereof.

61. The method of claim 55, wherein L is an organic radical selected from the group consisting of alkylene, arylene, cycloakylene, aminoaklylene, aminoarylene, aminocycloalkylene, thioalkylene, thioarylene, thiocycloalkylene, oxyalkylene, oxyarylene, oxycycloalkylene, acylalkylene, acylarylene, acylcycloalkylene units, and combinations thereof.

62. The method of claim 61, wherein the acylarylene unit is a 4-acylphenylene group having the following structure:



63. The method of claim 61, wherein the organic radical is a metal chelating agent.

64. The method according to claim 63, wherein the metal chelating agent binds at least one metal cation selected from the group consisting of cations of ^{52}Fe ,^{62}Cu, ^{64}Cu, ^{67}Cu, ^{67}Ga, ^{68}Ga, ^{86}Y, ^{89}Zr, ^{94m}Tc, ^{94}Tc, ^{99m}Tc, ^{111}In, $^{154\text{-}158}Gd$, and ^{175}Lu.

65. The method of claim 64, wherein the metal chelating agent is selected from the group consisting of DTPA, 1,4,7-triaza-cyclononane-N,N',N"-triacetic acid (NOTA), p-bromoacetamido-benyl-tetraethylaminetetraacetic acid (TETA), 1,4,7,10-tetraazacyclododecanetetraacetic acid (DOTA), EDTA, CHXa.

66. The method of claim 55, wherein B is selected from the group consisting of antibodies, proteins, glycosylated proteins, biomolecules, polysaccharides, peptidomimetics, low molecular weight organic compounds, and combinations thereof.

67. The method according to claim 66, wherein B is an antibody.

68. The composition according to claim 67, wherein B is a polyclonal antibody.

69. The composition according to claim 66, wherein B is a monoclonal antibody.

70. The method of claim 67, wherein B is an antibody raised against LOX-1.

71. A method of monitoring the efficacy of therapies for treating atherosclerosis comprising:

administering to a mammal the compound of claim 1;

optionally administering a clearing agent to remove the compound that is not bound to LOX-1;

subjecting the mammal to imaging effective to detect the signal generated by S to thereby detect the amount of LOX-1; and

repeating the administration and imaging procedures at least once over a period of time to detect the difference in amount of LOX-1.

72. The method of claim 71, wherein the mammal is suspected of a disease or disorder caused by expression of LOX-1.

73. The method of claim 71, wherein the imaging effective to detect S is positron emission tomography.

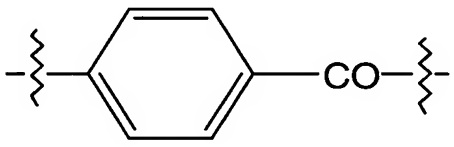
74. The method of claim 73, wherein S is selected from ^{18}F and ^{11}C.

75. The methodof claim 71, wherein S is selected from the group consisting of a luminescent dye, a radionuclide, a near infrared dye, a magnetically active isotope, a superparamagnetic particle, a metal ion having a Z value of greater than 50, an encapsulated species, and a combination thereof.

76. The method of claim 71, wherein S is selected from the group consisting of fluorescein, ^{11}C ^{18}F, ^{52}Fe ,^{62}Cu, ^{64}Cu, ^{67}Cu, ^{67}Ga, ^{68}Ga, ^{86}Y, ^{89}Zr, ^{94m}Tc, ^{94}Tc, ^{99m}Tc, ^{111}In, ^{123}I, ^{124}I, ^{125}I, ^{131}I, $^{154\text{-}158}Gd$, ^{175}Lu, superparamagnetic iron oxide nanoparticles, heavy metal ions, gas-filled microbubbles, optical dyes, porphyrins, texaphyrins, highly iodinated organic compounds chelates thereof, polymers containing at least one of the aforementioned components, endohedral fullerenes containing at least one of the aforementioned, and mixtures thereof.

77. The method of claim 71, wherein L is an organic radical selected from the group consisting of alkylene, arylene, cycloakylene, aminoaklylene, aminoarylene, aminocycloalkylene, thioalkylene, thioarylene, thiocycloalkylene, oxyalkylene, oxyarylene, oxycycloalkylene, acylalkylene, acylarylene, acylcycloalkylene units, and combinations thereof.

78. The method of claim 77, wherein the acylarylene unit is a 4-acylphenylene group having the following structure:



79. The method of claim 77, wherein the organic radical is a metal chelating agent.

80. The method according to claim 79, wherein the metal chelating agent binds at least one metal cation selected from the group consisting of cations of ^{52}Fe ,^{62}Cu, ^{64}Cu, ^{67}Cu, ^{67}Ga, ^{68}Ga, ^{86}Y, ^{89}Zr, ^{94m}Tc, ^{94}Tc, ^{99m}Tc, ^{111}In, $^{154\text{-}158}Gd$, and ^{175}Lu.

81. The method of claim 80, wherein the metal chelating agent is selected from the group consisting of DTPA, 1,4,7-triaza-cyclononane-N,N',N"-triacetic acid (NOTA), p-bromoacetamido-benyl-tetraethylaminetetraacetic acid (TETA), 1,4,7,10-tetraazacyclododecanetetraacetic acid (DOTA), EDTA, CHXa.

82. The method of claim 71, wherein B is selected from the group consisting of antibodies, proteins, glycosylated proteins, biomolecules, polysaccharides, peptidomimetics, low molecular weight organic compounds, and combinations thereof.

83. The method according to claim 82, wherein B is an antibody.

84. The composition according to claim 83, wherein B is a polyclonal antibody.

85. The composition according to claim 83, wherein B is a monoclonal antibody.

86. The method of claim 83, wherein B is an antibody raised against LOX-1.